together, for two reasons. Firstly, although the second collection must assuredly represent breeding-birds, Meadow Pipits in June are much too worn and bleached for critical taxonomic assessment. Secondly, the early onset of Meadow Pipit migration through the British Isles leaves us with no guarantee that the August–September collection of 1938 comprises native birds. It may well do so, but of this we cannot be certain. The facts of the case are that a bird which still has a good deal of juvenile plumage (and is quite inseparable from birds of similar age from Sweden, Iceland, the Outer Hebrides, Argyllshire and Lancashire) was selected as type, and the original description clearly refers to this indeterminate juv. > 1st. winter phase and says nothing about the greater saturation of colour above and below which distinguishes the Atlantic race. Thus, whilst it is abundantly clear that Mr. Clancey was the first to appreciate that two distinct populations of Meadow Pipit are present in the British area in autumn, it is unfortunate that he did not revise his diagnosis before Meinertzhagen described—correctly—*A. p. theresae*. As matters stand today, the name *whistleri* is technically a synonym of *pratensis*, and we are left with no option but to use *theresae* for the Atlantic race.

A comparative study of the method of skull pneumatisation in certain birds

by Jeffery G. Harrison

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Part Two

Method of Pneumatisation in the Starling.

There is very little difference in the method of pneumatisation in the early stages of the Starling compared with the House Sparrow, the difference being in stages 11–13 of the Starling, where the two "windows" in the frontal bones divide into four, stages which were not found by either Nero or myself in the House Sparrow.

The time factor. Ten immature Starlings examined on 2nd October were already fully pneumatised. Assuming that such birds were hatched in early May, this would indicate pneumatisation occurring in approximately five months, but nine others on the same date still possessed "windows" four of them being only half pneumatised. Probably therefore, six months would be the average time as for the House Sparrow.

Method of Pneumatisation in certain Corvidae.

This series of skulls demonstrates that the Carrion Crow, Rook, Jackdaw and Jay pneumatise by the same method and the smaller number of Magpies suggests that they also conform to this method. The method is unlike any of the others studied, notably in stages 9–18, while the last remaining pair of "windows" (17–18) are more centrally placed in the frontal bones than the equivalent "windows" in Starlings and House Sparrows and more irregular than in the pigeons.

The diagram showing the method of skull pneumatisation includes several alternative methods, as is indicated by the arrows. The following table gives the number and species examined, corresponding to the stages illustrated. Stage 19 represents the point at which pneumatisation has just reached completion, the outline of the last remaining "windows" to

pneumatise still being visible. Stage 20, the fully pneumatised adult skull is included in view of the findings of Verheyen.

Stage 1	2	3	4	5	6	7	8
Carrion Crow 2 Jay 1	Jay 1	Jackdaw 2 Jay 1	Jay 1	Jay 2	Jay 1	Rook 2	Jay 1

9	10	11	12	13
Carrion Crow 1 Rook 5 Jackdaw 1	Carrion Crow 1 Jay 3	Carrion x Hooded Crow 1 Rook 7	Carrion Crow 2 Rook 22 Jackdaw 2 Jay 3	Jackdaw 1

14	15	16	17	18	19
Rook 6 Jay 1	Rook 1	Jay 1	Carrion Crow 8 Rook 10 Jackdaw 2 Magpie 1 Jay 3	Rook 1	Carrion Crow 9 Rook 2 Jackdaw 1 Magpie 6 Jay 3

20
Red-necked Raven 2
Hooded Crow 10
Carrion Crow 40
Rook 25
Jackdaw 20
Magpie 30
Jay 150
Chough 1

The time factor. The Carrion Crow appears to be one of the quickest species of those examined to reach full pneumatisation. Four immatures examined on 4th, 6th, 13th and 18th July respectively were already complete and if one assumes that they were hatched in late April, this means that they have taken 2½–3 months to do this. A Rook was practically complete on 23rd June, two others were complete on 27th August, giving a 3–4 month time factor. A Jackdaw was complete on 30th July. Four young Magpies were complete on 15th August, 4th, 12th and 13th September respectively and a Jay by 28th August, so that these species appear to reach completion in 4–5 months.

These findings in *Corvidae* are at complete variance with those of Verheyen, who gave time factors of just over a year for *Corvidae* and included the Jay among those species in which the skull never reaches complete pneumatisation. It is difficult to understand how these differences could occur, but Verheyen was working on osteological material only and of the five skulls of Carrion Crows examined, one dated 28th May still showed two small "windows" and I would think that he has taken this to be from a bird already a year old, whereas I have no doubt that the skull was that of an immature bird of that spring. It is an error which can occur when the skull is not examined in conjunction with the plumage.

Verheyen studied twenty Jays' skulls, nineteen of them dated between September and December, one on 9th March. All showed variable "windows" from which it was assumed that the species does not develope complete pneumatisation. My father, Dr. James Harrison and I have examined between us approximately 150 Jays in adult plumage, all with fully pneumatised skulls, so that we cannot uphold Verheyen's findings.

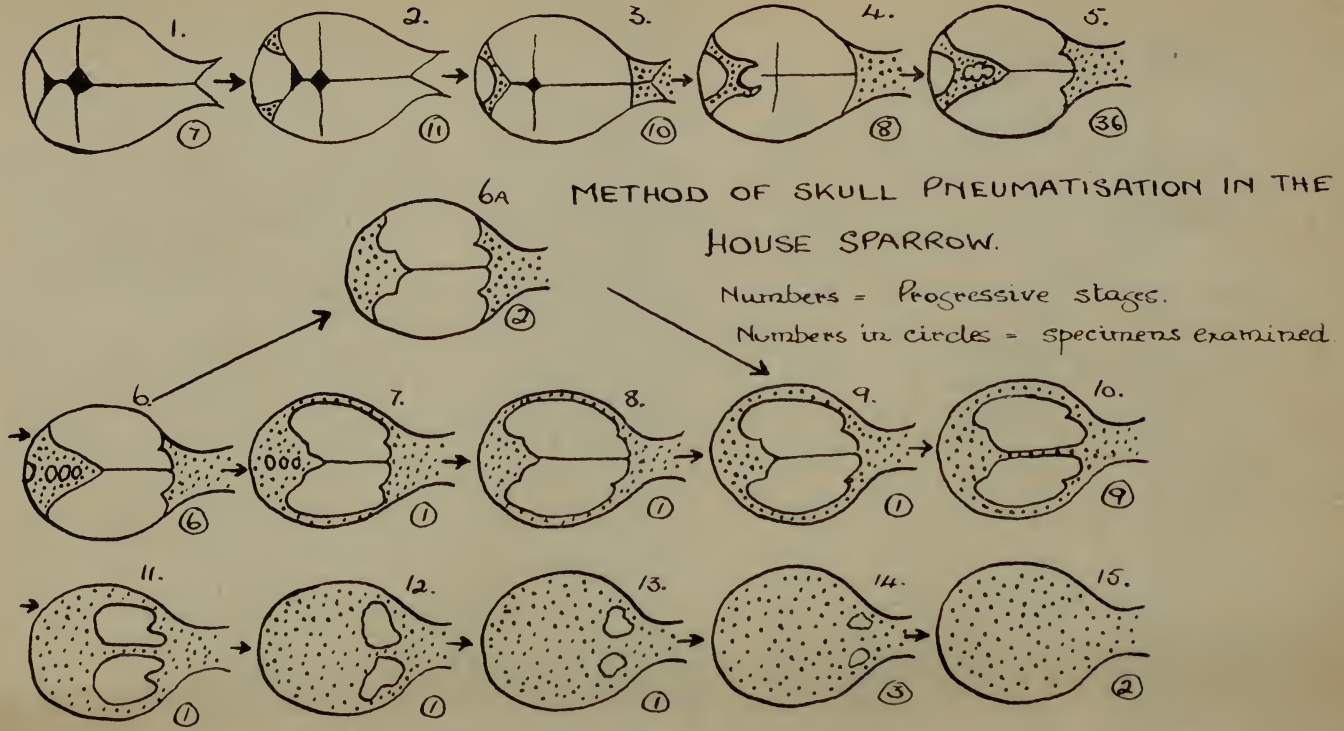
1.
2.
3.
4.
5.
7
11
10
8
36
6A
METHOD OF SKULL PNEUMATISATION IN THE
HOUSE SPARROW.
Numbers = Progressive stages.
Numbers in circles = specimens examined.
2
6.
7.
8.
9.
10.
6
1
1
1
9
11.
12.
13.
14.
15.
1
1
1
3
2

Diagram 3

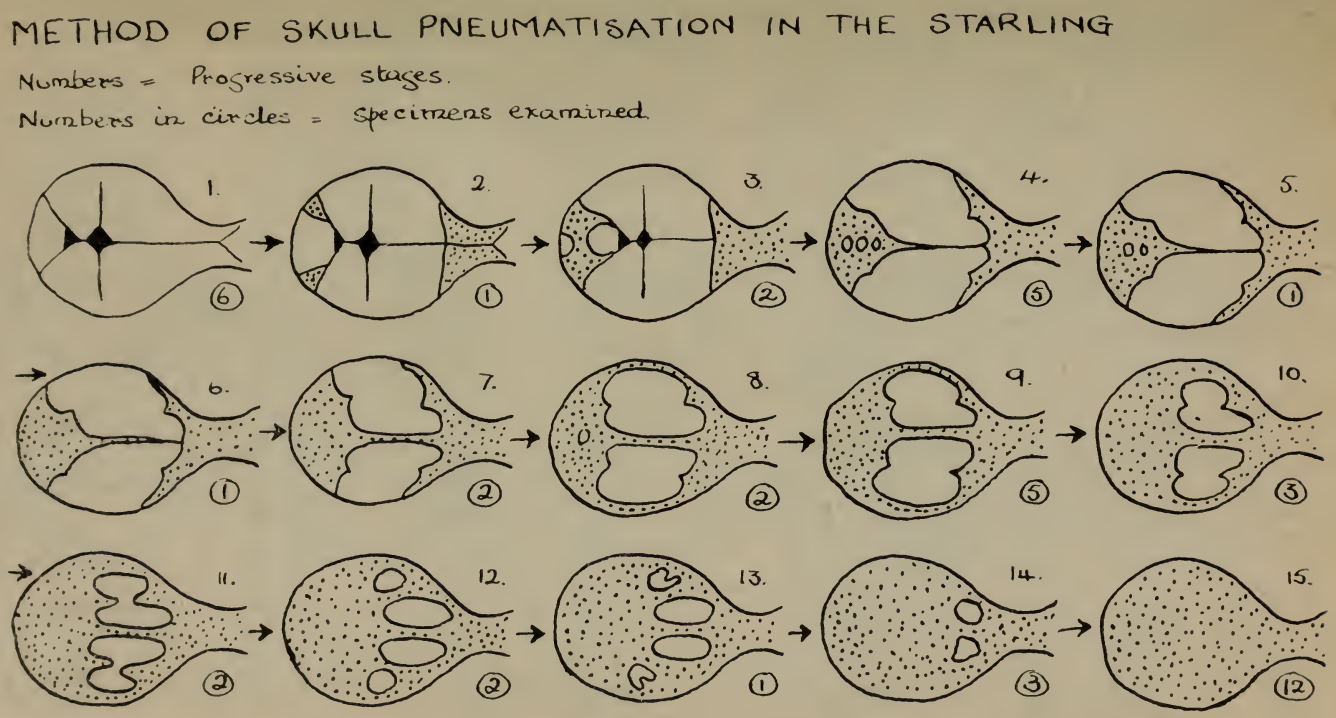
METHOD OF SKULL PNEUMATISATION IN THE STARLING
Numbers = Progressive stages.
Numbers in circles = Specimens examined.
1.
6
2.
1
3.
2
4.
5
5.
1
6.
1
7.
2
8.
2
9.
5
10.
3
11.
2
12.
2
13.
1
14.
3
15.
12

Diagram 4

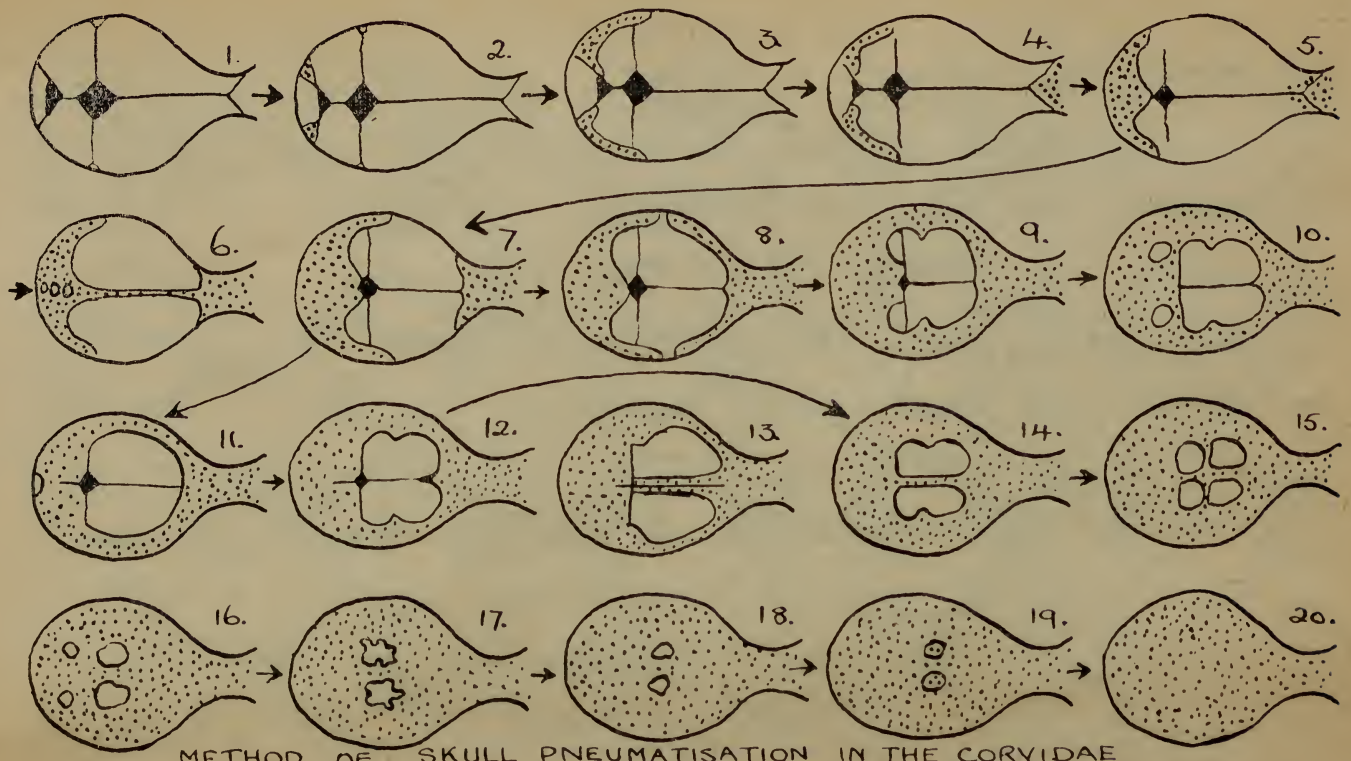
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.
20.
METHOD OF SKULL PNEUMATISATION IN THE CORVIDAE

Diagram 5

Summary and Conclusions.

1. The method of skull pneumatisation in a number of different species is examined.

2. Certain differences are demonstrated between three pigeon of the Genus *Columba* and two of the Genus *Streptopelia*, the Starling, the House Sparrow and the *Corvidae*.

3. Two groups of closely related species have been studied and although the two groups differ, the species within those groups pneumatise by the same method. (Wood Pigeon, Stock and Rock Dove: Carrion Crow, Rook, Jackdaw, Magpie and Jay.)

4. The method of skull pneumatisation in those species in which it reaches completion, seems likely therefore to provide evidence of systematic relationship.

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The South African races of the Red-billed Firefinch *Lagonosticta senegala* (Linnaeus)

by P. A. Clancey

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Sclater (1930), Vincent (1952) and McLachlan and Liversidge (1957) admit two geographical races of *L. senegala* from within the limits of subcontinental South Africa (*L. s. rendalli* Hartert, 1898: Upper Shiré R., southern Nyasaland, and *L. s. pallidicrissa* Zedlitz, 1910: Humpata, Huila, southern Angola), while Roberts (1940) lists only one. Study of 180 skins from southern Africa kindly placed at my disposal by the Directors of the East London Museum, the Transvaal Museum (through